



Blast Protection Solutions  
**Blast Relief Panel Systems**

Mech-Tool Engineering Ltd [MTE] designs, manufactures and installs world class Blast & Explosion Relief Systems for ease of installation into walls and roofs, tailored to specific project requirements to provide the most cost-effective solution.

Mech-Tool Engineering Limited has a significant track record in provision of fire and blast protection stretching back to the early 1970's when firewalls were first introduced on an offshore installation.

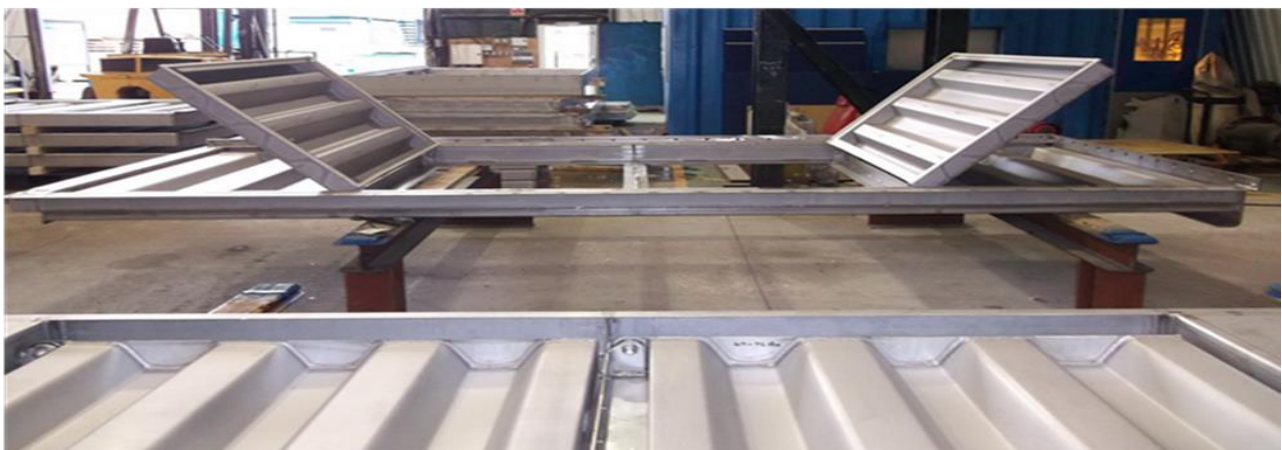
As awareness of potential hazards developed, blast relief was introduced as a method of mitigation of blast in enclosed areas. Adoption of this system would result in a much lesser requirement for reinforcement of equipment elsewhere, dependent on the strength of the enclosure.



More recently, explosion and pressure venting requirements have been identified through safety case studies for land-based establishments ranging from small gas turbine enclosures to full scale power stations. In some instances, the pressure rise occurs due to a high-pressure steam release, and temperature rise due to this also has to be protected against, resulting in dual purpose venting with panels opening under temperature or pressure triggers.

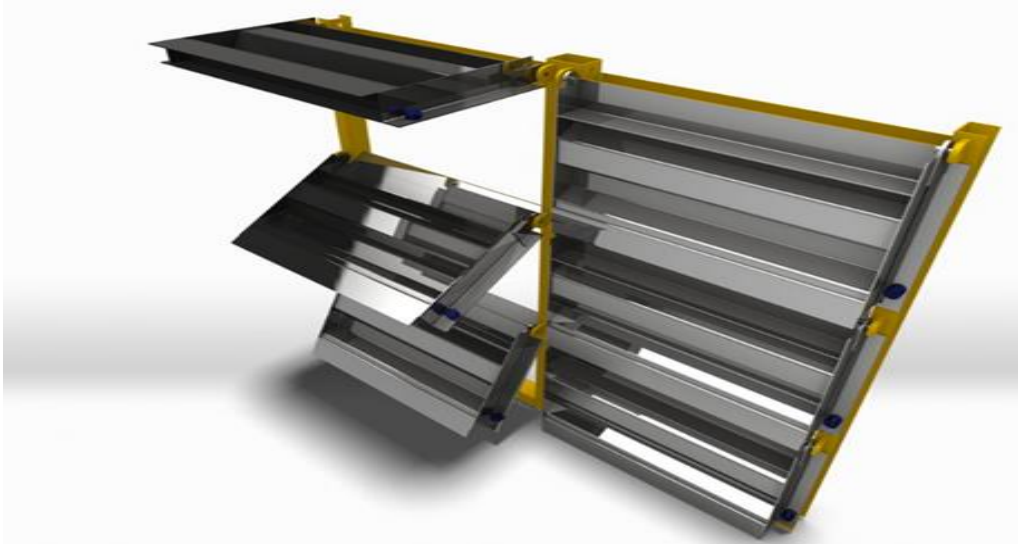
Whilst clearly it is desirable to eliminate the possibility of an explosion or other hazardous overpressure rise, and therefore not require any additional protection against blast, this is not always possible, and in these cases containment or mitigation methods must be considered. Venting panels, whilst not the only method of overpressure mitigation, is well proven technology which is inert in normal service and is reliable with the minimum of maintenance.

Hinged relief panels can be arranged such that they close after the event. Whilst not gas tight, this approach affords a degree of fire and smoke resistance which can offer additional safety advantages to the installation. Conversely, panels can be oriented so that they tend to remain in the open position after venting.



Blast relief can be incorporated at the build stage of the enclosure or retrofitted to existing enclosures. It is advantageous if possible, to incorporate the panels at the design stage so that the panels/enclosure configuration can be optimised. The retrofit option can, of course, be designed and engineered to suit the existing enclosure.

Location of blast relief panels should, where possible, be such that the venting is discharged to a safe location - for example up into the air or, in the case of an offshore installation, outboard over the sea.



Mech-Tool's venting panel design is based on conventional design parameters backed up by several series of full-scale testing including gas explosion testing, compressed air release and wind tunnel testing. These tests have been carried out by the UK Building Research Establishment at their Garston and Cardington test facilities. The results obtained have been correlated and are used as the basis for Mech-Tool's software that calculates the required area of venting for a given hazard and enclosure characteristics, for specified opening times and pressures.



Mech-Tool offers various types of venting system to cover likely scenarios within the hazardous areas outlined above. All systems are custom made to suit the application and location specified and can be retro-fitted into existing enclosures or built-in at the design stage.

Panels are purpose designed to meet any requirements specified by the Client. The main parameters affecting design include required opening pressure, required opening time to full venting, and predicted overpressure - time history. In addition, to design the enclosure, the layout and permitted areas that can be used for venting panels must be identified.

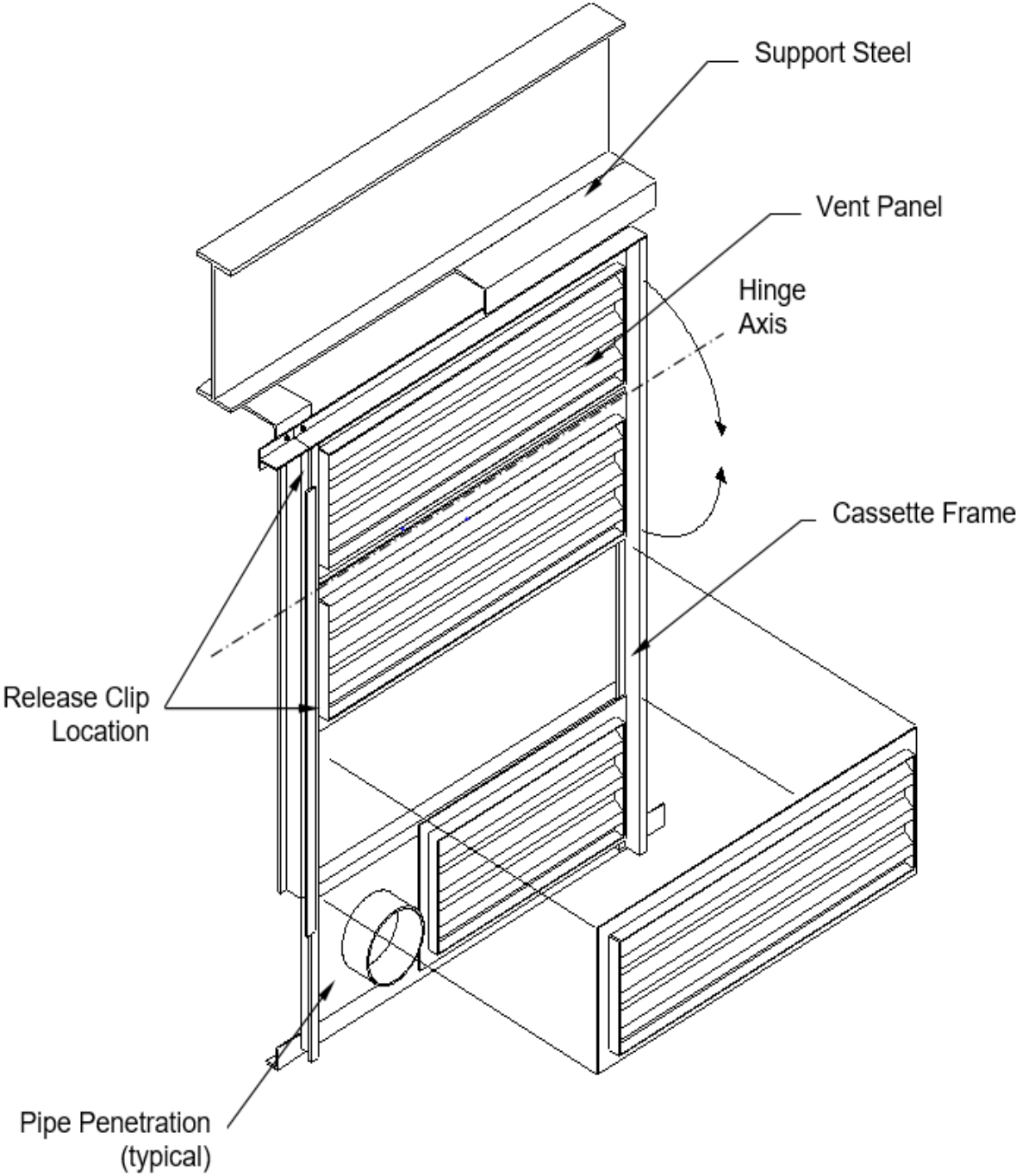


The traditional construction of a Mech-Tool blast relief system is a series of hinged panels pre-installed into a cassette frame, resulting in minimal erection time being required on site. The panel is designed to have the appropriate mass (or more specifically, inertia) to allow the panel to open in the required time. The construction of the panel is largely defined by this requirement and can be fabricated from aluminium, carbon or stainless steels or fibre reinforced composite. The hinged panels are utilised to prevent the doors becoming hazardous projectiles. Hinges generally consist of stainless-steel pins with isolation bushes where necessary, preventing dissimilar metal corrosion between the pin and the hinge plate.



For the aluminium or steel options the door consists of a profiled sheet with adequate stiffness to resist any environmental loadings, framed with angle or flat members as appropriate. A series of panels are installed into a frame, with each panel hinged at one end, and Mech-Tool's proprietary blast relief mechanisms are fitted at the appropriate positions to allow release at the correct pressure. Panels are supplied fully welded and finished as required by the Client, with frames pre-drilled for simple bolting into prepared openings. Weather seals can be provided where required. Pairs of panels are usually arranged to open back-to-back, which allows the panels' kinetic energy to be dissipated

Typical Venting System Details



## The MTE Advantage

- ✓ **Proven Performance** – Designed to meet your environmental requirements
- ✓ **Custom-Built Solutions** – Tailored to your project needs
- ✓ **Trusted Globally** – Installed in major energy and industrial facilities worldwide
- ✓ **Efficient Installation** – No specialist tools required

# Your Safety. Our Priority.

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